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Market potential and resource management of non-timber forest products (NTFPs) in the northern uplands of Vietnam

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Abstract: Fairly all selected NTFPs of the upland commune Ngo Luong in northwest Vietnam reveal a high market potential including opportunities for sustainable resource management. In order to achieve win-win situations at the research site, management of specific NTFPs through intensification or diversification applied by single households or interest groups is discussed. Apart from better management practices the NTFP producers' position within the market chain should be strengthened by calling for extension trainings on marketing relevant features. These findings base on investigations of household income, NTFP extraction and market chains of economically valuable NTFPs.

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Market potential and resource management of non-timber forest products (NTFPs) in the northern uplands of Vietnam

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Introduction

The use of non-timber forest products (NTFPs) is often considered to support forest conservation and to offer a higher and more valuable income source for the poor than timber exploitation (MAHAPATRA & TEWARI 2005, ARNOLD & RUIZ-PÉREZ 2001, WUNDER 2001). It lies in the nature of NTFPs, however, that they are easily subject to overexploitation, especially when they become economically more attractive through an increased market demand, locally added value, or improved market conditions. Also, despite such altered conditions, NTFP producers are usually still faced with low returns due to weak organisational structures at community level, leaving them with little market power (BHATTACHARYA & HAYAT 2004). The economically driven unsustainable resource management of NTFPs, both in the sense of ecological and socio-economic sustainability, is moreover triggered by weak legal frameworks on property rights, harvesting and trading issues as well as ineffective implementation practices through local forest services. Also a lack of understanding of specific market mechanisms of NTFPs impedes the promotion of sustainable NTFP development, including well-adapted legal regulations (TEDDER *et al.* 2002). However, if the markets are known, stable and more remunerative to producers, the combination of conservation and local rural development through sustainable management, domestication and cultivation can be effective.

This paper contributes to the discussion of local rural development through NTFPs. It focuses on NTFP market abilities, resource management and ways to improve local livelihood conditions for poor households. It presents an analysis of the market situation of relevant NTFPs, including their resource management, and identifies whether these NTFPs can significantly contribute to the rural development of two studied villages in the northern uplands of Vietnam.

Importance of NTFPs in Vietnam

VU VAN DUNG *et al.* (2002) reveal the high economic and ecological value of NTFPs for at least 8.5 million forest dwellers or 10.4 percent of Vietnam's population that live mainly in the upland areas and belong to ethnic minority groups. However, trade activities are in the hands of a few state and provincial companies and various small scale traders. Several enterprises and 1400 traditional handicraft villages in Vietnam are involved in processing bamboo and rattan, which achieved an annual export growth rate of twenty percent compared to the general export growth rate of fifteen percent in 2003 (PHAN SINH 2004). Apart from handicrafts, bamboo still accounts for half of the domestic construction sector in rural areas (VU VAN DUNG *et al.* 2002). The national focus of economically valuable NTFPs lies primarily on cinnamon and Chinese medicinal herbs. In fact, the international demand for medicinal plants is currently high with an annual growth rate of ten to fifteen percent (SWITZER *et al.* 2003). Also vegetables, mushrooms and ornamental plants like orchids are considered as promising products (MITTLEMAN 1997).

As the biodiversity of flora is tremendous thanks to the different climatic and topographic conditions in Vietnam, the number of vascular plant species is estimated to 15000 to 20000 species, whereas approximately ten percent are endemic to Vietnam. The national IUCN Red List classifies 25 species as critically endangered, 37 as endangered and 83 as vulnerable.¹ Around 3400 medicinal plant species are identified in Vietnam, eighty percent of which occur wild in the mountainous provinces, home of ethnic minority groups (LUU DAM CU 2003). Bamboo is represented with 92 species (VU VAN DUNG & LE VIET LAM 2004). Among the frequently used plant species, 175 species are considered as important NTFPs in Vietnam (VU VAN DUNG *et al.* 2002).

The double-bind challenge to conserve and protect natural resources and to promote NTFPs for filling gaps in the household income of poor farmers is a concern of national governments, NGOs and research institutes all over the world (SUNDERLIN *et al.* 2003). Activities in this sector were initiated by the Vietnamese government, among others through the Law on the Protection and Development of Forests, definitely revised in 2004 including the ongoing process of forest land allocation since 1991, and the Comprehensive Poverty Reduction and Growth Strategy (2001–2010). Projects on forest conservation and sustainable development of forests and NTFPs are implemented by the national offices of Flora and Fauna International, WWF and Tropenbos. Various studies on NTFPs and their market potential have recently been conducted in cooperation with foreign donors in Central and Northern Vietnam (e.g. HILFIKER 2005, LE THI PHI *et al.* 2004, WETTERWALD *et al.* 2004, BIEN QUANG TU 2000).

In this paper we ask whether enhanced marketing of NTFPs allows for poverty mitigation in the long term and whether it can be in accord with key principles of resource conservation. Up to now, such win-win outcomes of both commercialising NTFPs and protecting the resource base are still rare. The notion that they can make valuable contributions to livelihood improvements in specific cases (SUNDERLIN *et al.* 2005) guides our investigation of the potential of nine NTFPs, identified in two villages of Ngo Luong commune in northern Vietnam. Our key concerns are to give a clearer picture of the market and ecological situation of the selected NTFPs and to seek favourable development strategies through NTFP commercialisation in Ngo Luong commune. NTFPs are here understood as all plants and mushrooms that are mainly collected from natural or enriched forests and cultivations with the exception of timber and fuel wood.

¹ UNEP 2001: State of the Environment in Vietnam 2001, <http://www.rrcap.unep.org/reports/soe/vietnam/Issues/biodiversity/#Diversity1> and IUCN Red List of Threatened Species, <http://www.redlist.org> (January 13, 2006).

NTFP group	Number of species	Part	Use with number of NTFPs		Specific use
			C	T	
Medicinal plants	61	Bark	3	3	C: As daily tea or occasional mix against sleeping difficulties, cough, headache, stomach ache, accouchement and menstruation inconveniences. T: At rather lower intensity to end consumers in the surroundings near Ngo Luong commune or at higher extent to middlemen processing and carrying the product to middlemen in the urban areas or at the Chinese border.
		Entire plant	0	6	
		Herb	0	1	
		Leaf	2	1	
		Rhizome	2	5	C: Food, house/cattle shelter/hedge building, occasionally for handicrafts. T: Food, construction (foundation, scaffold), paper industry, handicrafts.
		Shrub without rhizome	10	1	
		Stem	11	3	
		String	6	1	
Bamboo	10	Shoots	4	3	C: Food, house/cattle shelter/hedge building, occasionally for handicrafts. T: Food, construction (foundation, scaffold), paper industry, handicrafts.
		Culms	10	3	
		Sheaths	0	1	
Ornamental orchids	3	Entire plants	3	3	C: Mostly stored until customers are present. T: ornamentation.
Mushroom	2	Entire plants	2	2	C: Food. T: Only in emergency situations.
Extracts	3	Fruits, seeds	1	3	C: Food. T: Food, extract for lacquerer.
Others	2	Entire plants	2	0	C: Food for cattle, packing material.

C = Consumption, T = Trade. Single nomination of parts for C and T for medicinal plants and others. Multiple nomination for the remaining NTFP groups.

Table 1: Overview of the NTFPs identified by the key-informants in Ngo Luong commune.

Tabelle 1: Überblick zu den durch Schlüsselinformanten identifizierten NTFPs in der Gemeinde Ngo Luong.

Methods

Research site

Ngo Luong commune is one of five upland communes of Tan Lac district of Hoa Binh province (see *map 1*). The commune belongs to the priority area of the Extension and Training Support for Forestry and Agriculture in the Uplands Project (ETSP) in Hanoi, which is implemented by Helvetas Switzerland and funded by the Swiss Agency for Development and Cooperation (SDC). This paper is extracted from a one-year study initiated by ETSP (HILFKE 2005). The commune has been selected because of its high forest cover of 80 percent compared to the average forest cover in Tan Lac district of 64 percent. The entire forested area in Ngo Luong commune accounts for 3090 ha and is classified as natural protection forest. In 1996, forest land has been mostly allocated to households. According to the standards of the Ministry of Labor, Invalid and Social Affairs (MoLISA) Ngo Luong commune is ranked as a poor upland commune with an annual income of 1.2 million VND² per person. The inhabitants of Ngo Luong commune belong to the ethnic group of Muong, one of the six poorest minority groups in Vietnam (VIETNAM DEVELOPMENT REPORT 2003). The two studied villages were Luong Tren with 58 households and the more remote Bo village with 25 households. Due to the commune's remoteness (one hour by car to the next commune and another hour to commune and district market places), trade activities of NTFPs are currently limited to few residents and lowland middlemen owning motorbikes or lorries.

PRA, RMA and semi-structured interviews

In order to reveal the diversity, use and economic value of NTFPs an income survey of eight households with a high dependency on NTFPs was conducted in each of the two villages in March and April 2004. The identified NTFPs were classified into bamboo, medicinal plants, ornamental orchids, mushrooms, extracts and other NTFPs (see *table 1*). From the identified NTFPs key informants selected the ten most important



Map 1: Vietnam showing the research area.

Karte 1: Vietnam mit Forschungsgebiet.

species in each village through a NTFP matrix ranking. In order to enable a final selection of the five economically most interesting NTFPs in each village, further information on biology, harvesting, semi-processing, trade and legal applications was collected in workshops applying Participatory Rural Appraisal (PRA) exercises. As a result, nine NTFPs (see *table 2*) were selected to conduct an in-depth market analysis using the approach of Rapid Market Appraisal (Joss *et al.* 2004). In order to check the correlation between household cash income and the NTFP contribution a Spearman rank correlation test was applied. The data set of the household incomes and NTFP contributions was tested for deviation from the standard normal distribution (Kolmogorov-Smirnov test). Semi-structured in-

² 1000 VND ≈ 0.063 \$, October 20, 2004.

Table 2: Presentation of the nine studied product chains.

Tabelle 2: Präsentation der neun untersuchten Produktketten.

Latin species name	Plant type	Product	Use of end consumers	Market demand/trend	Place of final traders or processing units
<i>Dendrocalamus asper</i> Backer ex. Heyne	Bamboo	Shoot	Food	Very high/increasing	Hang Da market in Hanoi
<i>Dendrocalamus asper</i> Backer ex. Heyne	Bamboo	Culm	Paper making	High/increasing	Pulp factory in Ky Son, HB
<i>Bambusa blumeana</i> J.A.	Bamboo	Culm	Handicraft	Very high/increasing	Dan Hoa commune, HT
			Construction	Very high/stable	Thai Ha, Trung Kinh and Kim Nguu street in Hanoi
<i>Indosasa angustata</i> Mc Clure	Bamboo	Stick (processed culm)	Comb making	Moderate/declining	Thai Hoc commune, HD
<i>Indosasa angustata</i> Mc Clure	Bamboo	Sheath	Hat making	High/stable	Chuong commune, HT
<i>Aerides odorata</i> Lour.	Orchid (epiphyte)	Entire plant	Ornamentation	Very high/increasing	La Phu and Dong La commune, HT
<i>Drynaria fortunei</i> (Kuntze) J. Smith	Fern (epiphyte)	Rhizome	East and North Traditional Medicine	Very high/increasing	Lan Ong street in Hanoi
<i>Nervilia fordii</i> (Hance) Schlechter	Orchid (terrestrial)	Leaf	North Traditional Medicine	Very high/increasing	Border gate in Lang Son province (black market to China)
<i>Anoectochilus setaceus</i> Blume	Orchid (terrestrial)	Entire plant	North Traditional Medicine	Very high/increasing	Border gate in Lang Son province (black market to China)

HB = Hoa Binh province, HD = Hai Duong province, HT = Ha Tay province. 1000 VND (Vietnamese Dong) = 0.063 \$ (October 20, 2004).

interviews with around 130 relevant market actors, located mainly in the provinces of Hoa Binh and Ha Tay, were the main method for data collection. The interviews generated detailed information on market place, product, price and promotion as well as tax and legal issues.

Importance of NTFPs in Ngo Luong commune

Out of 54 households in the two studied villages, 11 households depend highly on NTFPs. NTFP dependency is medium for 15 and low for 29. For one household NTFPs are irrelevant. According to the income survey of the sixteen studied households, there is no significant relation between household cash income and share of NTFP cash income (Spearman correlation coefficient, $r_s = -0.162$ with a probability, $p = 0.549$). The average NTFP contribution to the cash income of eight households is higher in Bo village (16.3 percent) than in Luong Tren (9.8 percent). Regarding different NTFP types, wealthier households rather rely on bamboo products as single NTFP source, whereas poorer households depend on three or four NTFP types, which they mostly collect from the natural forest.

In total, 81 plant species were identified by household representatives, whereas those in Bo village listed a broader range of NTFPs. Table 1 gives an overview of NTFP groups, number, part and specific use. NTFPs are used for own consumption, for commercialisation or for both. The medicinal application of certain plants traded at large scale and mainly exported to China, like *Anoectochilus setaceus*, seems to be unknown to the interviewed NTFP producers in Ngo Luong commune.

Market situation of short-listed NTFPs

NTFPs are generally considered to have rather a gap-filling function for the household economy than the potential to improve livelihoods of poor people in the long term (SUNDER-

LIN *et al.* 2003). Nonetheless, the understanding on market relevant mechanisms including product chains is highly relevant to identify valuable return options and to prevent the creation of poverty traps. An increased market understanding of NTFPs includes information on demand and offer as well as requested quality of a specific NTFP. Furthermore, updated knowledge on storage and locally added value is crucial to react in a flexible way to market changes and to achieve products of higher quality. Another point is transparency in transportation issues, such as tax regulations and informal fees. In the following sections, these market relevant points are presented for the nine short-listed NTFPs to reveal the potential for enhancing rural development in Ngo Luong commune.

Market demand

Table 2 presents the nine short-listed NTFPs with economic and commercial value. It indicates that the market demand for almost all nine NTFPs is high at the places of the contacted final traders in northern Vietnam. In particular, the domestic demand for bamboo shoots is increasing because of its favourable nutrient value. In the global context, the demand rapidly increased at almost 25 percent during the last couple of years (BISWAS & SRIKANTH 2003). As equally the international bamboo handicraft sector is flowering, there is a permanent demand particularly for culm species with good mechanical characteristics, fulfilled for example by *Bambusa blumeana*. Also the domestic paper industry constantly seeks this kind of material. A national strategy foresees meeting 85–90 percent of the domestic demand by 2010 (HA CHU CHU 2004). Culms of the species *Dendrocalamus asper*, occurring in Ngo Luong commune, are used by the pulp factory in Hoa Binh province (see figure 1). However, the domestic demand for traditional combs, made from sticks of *Indosasa angustata* culms, is stagnating or even declining as substitute products become more appealing. On the other hand, there is a high demand for sheaths which are used for the typical Vietnamese conical hats, a product that is still widely worn for crop work, and exported overseas as accessories and souvenirs.

Table 3: Market relevant features of the nine NTFPs.*Tabelle 3: Marktrelevante Merkmale der neun NTFPs.*

Latin species name	Product	Product quality	Economical value at forest gate	by final traders	Price fluctuation
<i>Dendrocalamus asper</i>	Shoot	Young, entire, round shaped, bright yellow coloured and soft	1200–2000 VND/kg boiled	7000 VND/kg boiled	20–30%
<i>Dendrocalamus asper</i>	Culm	No signs of decay	185 VND/kg	280 VND/kg	–
<i>Bambusa blumeana</i>	Culm	Handicraft: 7–12 cm diameter, often 5 m long, 4–6 years old	400 VND/m	1000–1400 VND/m	–
		Construction: 4–8 cm diameter, minimal 1.5–2 m long	400 VND/m	1000–1500 VND/m	20%
<i>Indosasa angustata</i>	Stick	Minimal 50 cm long, 2.5 cm wide, without pith and steamed	20 VND/stick	Are processors (make combs)	–
<i>Indosasa angustata</i>	Sheath	45–50 cm long, 35 cm wide, bright or slightly coloured, even, without tears	30–40 VND/sheath	70–80 VND/sheath	Max. 50%
<i>Aerides odorata</i>	Entire plant	Big, healthy (without broken leaves), building flowers and new leaves	5000–7000 VND/kg	23 000–30 000 VND/kg	Max. 50%
<i>Drynaria fortunei</i>	Rhizome chip	Absolutely dry, uniformly 3–5 mm, of yellow colour, without hair and fungi traces	4000–5000 VND/kg dry ¹	12 000–20 000 VND/kg dry	Stable
<i>Nervilia fordii</i>	Leaf	Sun dried, fragrant and deep grey or blue	40 000–50 000 VND/kg dry ²	130 000–140 000 VND/kg dry	Stable
<i>Anoetochilus setaceus</i>	Entire plant	Raw and clean	40 000–50 000 VND/kg raw	60 000–120 000 VND/kg raw	Stable

¹ Product prices refer to 2003. Mostly sold as raw product for 500–800 VND/kg raw.

² Mostly sold as raw product for 2,000 VND/ kg raw.

Thanks to the improved living standard in Vietnam, ornamental plants start becoming prestige objects, relevant for the NTFP species *Aerides odorata* collected in Ngo Luong. This species figures on top of ornamental orchids because of its special fragrance.

Regarding medicinal plants, the WHO estimates that more than 80 percent of the Asian population relies on traditional medicinal products, many of them NTFPs (SWITZER *et al.* 2003). Their use is «natural», non-narcotic, shows no side-effects and is especially affordable for the poor.³ A medicinal NTFP with effects on kidneys and blood circulation is the rhizome of *Drynaria fortunei*. It is one of the most traded species in Nghia Trai, a village with traditional medicinal activities southeast of Hanoi (JHA 2001). In contrast, *Nervilia fordii* and *Anoetochilus setaceus* only experience a demand from neighbour countries, especially China.

Product supply

Apart from two NTFPs, the short-listed NTFPs in Ngo Luong commune only contribute to a low extent to the trade volume of the identified final traders in northern Vietnam. In 2003, the estimated supply for sticks made one tenth of the annual required quantity of the processors in Thai Hoc commune of Hai Duong province (see map 1). In the same year the supply proportion of *Aerides odorata* from Ngo Luong commune was one twentieth at the nursery places in Hoai Duc district. Most of this species grows abundantly in two other upland districts of Hoa Binh province (Tan Lac and Mai Chau).

Product price and quality

With the exception of paper culms and sticks the final traders of the selected NTFPs achieved relatively high product prices per unit in 2003 (see table 3). Underlying seasonal fluctuations, bamboo shoots are more expensive at the beginning and the end of the shoot sprouting period in late April and early October. A significant price rise of up to 40 percent takes place around Tet holiday (the Vietnamese New Year) caused by the seasonal supply shortage in winter and an increased customer demand. Also demand driven are value increases for construc-

tion culms in January to February and August to November, and for *Aerides odorata* in June to September because of its flowering time. The strong annual price fluctuations of bamboo sheaths are usually caused by specific weather conditions.

Apart from paper culms, each NTFP shows certain quality requirements. A quality check usually takes place by middlemen and only rarely at the forest gate in Ngo Luong commune. The locally added value of bamboo shoots, the rhizome of *Drynaria fortunei* and the ornamental orchid by the NTFP producers in Ngo Luong commune is not much considered, which partially explains the relative big difference of product price between forest gate and final trader (see table 3).

Storage and locally added value

Out of the nine short-listed NTFPs only bamboo sticks are adequately semi-processed in the locality. All others are processed by middlemen, such as those from Dong Phuong Yen and Ha Dong (see figure 1), who intensively clean and store them by applying special methods. Bamboo shoots are for example pickled in salt water or air dried in order to increase storage time and product value. Culms for handicrafts and construction are classified into different diameter classes according to their end use, short-cut and maximally stored for one month in Dan Hoa commune. In the adjacent commune Chuong My, sheaths are used for hat making, further sold or stored in completely dry conditions or under sulphur ventilation for two or three years. Cultivators in Hoai Duc district keep orchids in nurseries equipped with multi-level frames and a black cover permeable to air and limited to sunlight. Depending on the species, orchids are put on the convenient substrate and provided with nutrients. Vegetative reproduction is also applied. The rhizome of *Drynaria fortunei* is sliced into chips, mostly sun dried and its hair is burned away in Nghia Trai village. The leaves of *Nervilia fordii* are sun dried to

³ Malaisamy, A; Ravindran, C. 2003: Medicinal plants: where do we stand globally? Website: <http://www.techno-preneur.net/new-timeis/ScienceTechMag/May03/globally.htm> (January 13, 2006).

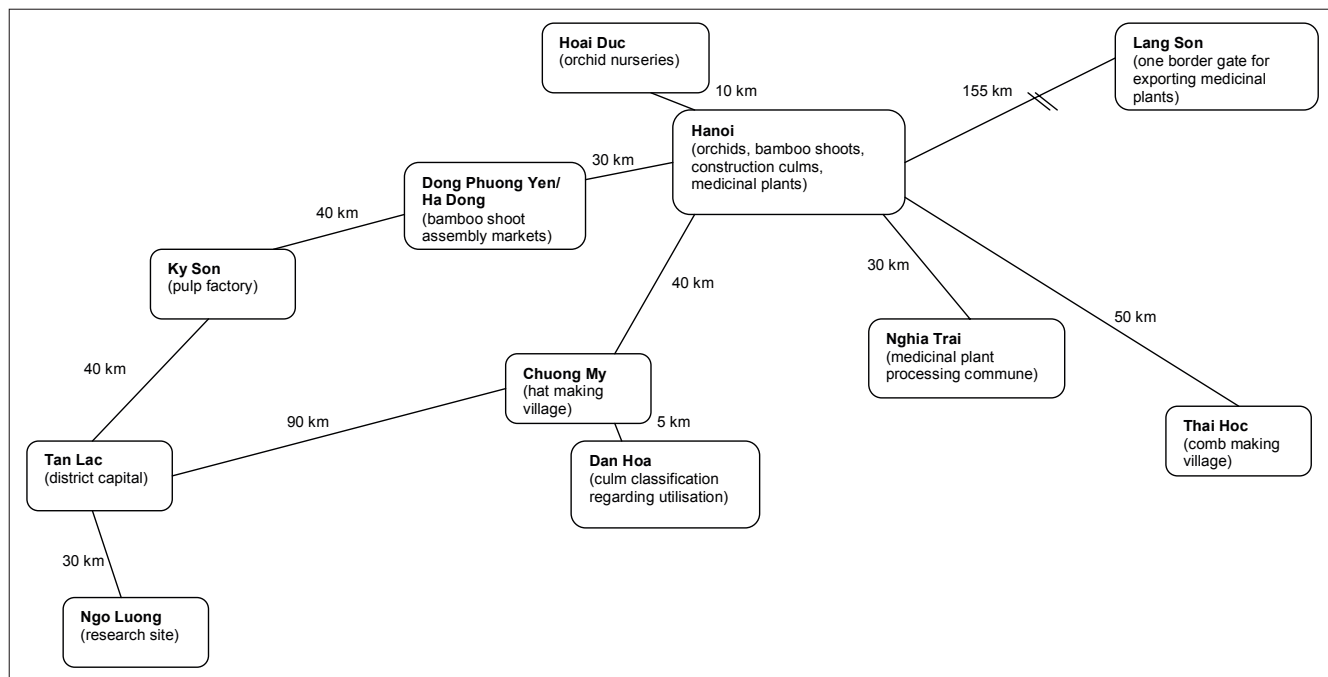


Figure 1: Contacted market places in Northern Vietnam.

Abbildung 1: Besuchte Marktplätze im nördlichen Vietnam.

increase the storage time, and further processed by Chinese traders or pharmaceutical companies. The most convenient storage method for the raw plants of *Anoectochilus setaceus* is to expose them on the ground without touching each other, and to slightly humidify them from time to time.

Transportation, tax regulations and informal fees

NTFP producers in Ngo Luong commune mainly transport their commodities in nylon bags by motorbike, which has especially negative impacts on the appearance of ornamental orchids. Lorries are seldom rented as the capacity is hardly attained and rents are usually unaffordable. Middlemen from the lowlands transfer culms, sheaths, sticks and partially shoots on lorry, but the bad road conditions in the rainy season limits the access to the commune. Communal transfer fees were 50 000–70 000 VND/lorry in 2003.

Despite the regulation on resource and value added tax for bamboo shoots and culms issued in the tax document Provincial People's Committee Hoa Binh, No. 1024/QD/UB from 9 July 2003, its implementation is not yet transparent. For instance, bamboo sheaths are officially excluded from taxes. Nevertheless, tax collectors from the local offices request fees to the same extend as for culms. The short-listed medicinal and ornamental NTFPs are not subject to taxes according to the tax document. This disagrees with the Ordinance on Royalty, amended on 28 April 1998, and the Law on Value Added Tax from 1 January 1999. According to these edicts resource and value added tax would make together 10% of the economic value of forest products (Vu VAN DUNG et al. 2002). Forest rangers and police at district level rather claim informal fees for overloading and for missing permission letters in cases of shoot and sheath transport than for resource exploitation and trade.

Overall, the market analysis of nine short-listed NTFPs reveals that all of them are not only subsistence products but show a market demand beyond Ngo Luong commune. They could have the potential to contribute to an improvement of the livelihoods of poor households, especially if methods for locally added value are applied and more consideration given to quality. Locally processed NTFPs are crucial for asking higher prices from the middlemen and for establishing solid trade networks that benefit the local NTFP producers.

Resource management in Ngo Luong commune

The question of how to improve rural development in Ngo Luong commune through the short-listed NTFPs has not only an economic but also an ecological dimension. When NTFPs become economically more valuable they are often subject to overexploitation. It is therefore necessary to have an idea of relevant issues such as current availability, harvested part, regeneration ability, domestication and cultivation opportunities, access and property rights as well as legal framework and its implementation when designing strategies for promoting a specific NTFP. The current resource management situation in Ngo Luong commune is presented with respect to bamboo, medicinal and ornamental products.

Bamboo products

Bamboo stands of *Indosasa angustata*, *Dendrocalamus asper* and *Bambusa blumeana* accounted for 1.7 percent of the commune area (PHAN HONG HUNG 2004). Thereby, *Indosasa angustata* showed the widest distribution in 2003 although its availability was strongly declining until 1999 as a result of the customer demand for sticks. At that time, farmers started to cultivate the species in their allocated land in order to ensure the economically interesting resource. Cultivation efforts for the also economically interesting *Bambusa blumeana* are absent, however, as seeds and the knowledge on appropriate vegetative propagation are missing. Despite the partial shoot trade of the cultivated *Dendrocalamus asper*, its clusters are currently largely over-aged, which can be explained by missing market channels for culm products. Culms of the other two species are exploited at any time correlating with customers' demand or own needs. Sheaths of *Indosasa angustata* are usually picked up in June. According to the specific shoot sprouting seasons, shoots of *Indosasa angustata* are harvested at an intensity of around 65 percent from February to April and those of *Dendrocalamus asper* from June to August. Considering the national legal framework on bamboo exploitation, only the situation for culms is stipulated in Decision 08/2001/TTg (Vu VAN DUNG et al. 2002). In Ngo Luong commune itself,

proprietors of cultivated bamboo stands are responsible for the resource management. Offences are regulated through traditional rules exercised by the village leader.

Medicinal products

A number of medicinal NTFPs occurring in Ngo Luong commune are classified as threatened in the Red Book of Vietnam, among them also the epiphytic fern *Drynaria fortunei*. During the last few years its abundance particularly declined around the settlements. Nonetheless, informants in both research sites estimated a harvested quantity of 40 tons of raw rhizome in 2003. The harvesting turn for this species takes about three years as long as young fronds are left for regeneration. The rhizome is mostly collected in autumn, which corresponds with the lean season of the agricultural calendar. The product is still freely traded although *Drynaria fortunei* is subject to the Regulation on Inspection of the Transportation, Production and Business of Timber and Forestry Products of 12 March 1999 (article 9, clause 2). Forest rangers explain the ineffectiveness of the regulation with the small traded quantities for which transportation certificates cannot be issued. Because of their high economic value also *Anoetochilus setaceus* and *Nervilia fordii* are illegally exploited and traded despite their appearance as strictly forbidden plant species in Decree 48/2002/ND-CP from 22 April 2002. *Anoetochilus setaceus* has already experienced an overexploitation and now occurs seldom in undisturbed forest parts in Ngo Luong commune. Likewise, *Nervilia fordii* appears in a few spots although only its single leaf is economically interesting, which appears from May to August. Up to now, many NTFP producers in Ngo Luong commune are unfamiliar with domestication and cultivation of these three medicinal plant species. However, there is the option to cultivate *Drynaria fortunei* and *Nervilia fordii* at household scale, as experiences in other upland villages in northern Vietnam show (TRAN VAN ON & NGUYEN QUOC HUY 2004). For *Anoetochilus setaceus* knowledge on its domestication could not be found.

Ornamental product

Not only the occurrence of medicinal NTFPs has declined in Ngo Luong also the abundance of the epiphytic orchid *Aerides odorata* has been significantly reduced with the increased market demand. It is estimated to be even lower in Luong Tren than in Bo village. Although resource users are familiar with sustainable exploitation methods, the entire orchid including its roots is usually harvested. It is explained by the fact of the open access regime and favourable returns for collectors. The quality of the orchid is best when freshly harvested. The longer *Aerides odorata* is kept in pots or attached to trees in the private home gardens, the more its appearance aggravates. Lack of time for adequate treatment and suitable equipment are causes for reduced quality. From a legal point of view, exploitation and trade of orchids as forest products are principally forbidden. Nevertheless, the traded quantity out of Ngo Luong commune was estimated at one ton in 2003. Forest rangers argue that they have monitoring difficulties, especially because ornamental orchids are traded the whole year round.

In sum, the presented NTFP species all show the typical signs of overexploitation once market demand increases. Although they are subject to regulation the legal frameworks usually are not strictly implemented in remoter areas. It is thus necessary that strategies to improve livelihoods through NTFP commercialisation are combined with resource management concepts that aim at a sustainable resource use.

Impacts of different strategies for improving household income and rural development in Ngo Luong commune

This paper shows that, on the one hand, the market situation of nearly all nine NTFPs is promising. On the other hand, a number of them are subject to overexploitation, not least because of immediate cash income needs. The combination of weakly implemented resource management linked with open access regimes for NTFPs from the natural forest does neither protect the resources nor benefit the livelihoods of the poor. However, the current returns to NTFP producers in Ngo Luong commune could be enhanced as soon as product quality and storage period were significantly improved. In the following, options for win-win situations and basic conditions are outlined.

Focus on NTFP promotion through intensification and diversification

An intensification of NTFP management promises to lead to higher returns if access to market and credit, property rights, labour force, time of appropriate maturity and knowledge of small-scale businesses are guaranteed (SUNDERLIN *et al.* 2005). In Ngo Luong commune, a trade intensification of the ornamental orchid species *Aerides odorata* could improve livelihoods thanks to the annual high market demand and the opportunity to cultivate and multiply it through vegetative reproduction. Building a nursery in Ngo Luong commune would, on the one hand, positively affect the conservation of its resource basis in the natural forests, as long as the poor households mainly depending on this resource take part in such a project. On the other hand, it would provide an ensured income in the long run. This strategy requires an adaptation of the legal framework regarding extraction and trade of cultivated orchid species, extension trainings on storing orchids and vegetative reproduction as well as a simplified access to credit calling for a business plan preferably elaborated by an interest group of poorer households.

Investing in different NTFPs with complementary seasonal availability and market demand is a further opportunity to ensure household income throughout a year. Indeed, such a diversification is given in Ngo Luong commune. Bamboo shoots of *Indosasa angustata* are harvested in spring. Shoots of *Dendrocalamus asper* and sheaths of *Indosasa angustata* are collected in summer and the rhizome of *Drynaria fortunei* is gathered in autumn. If *Bambusa blumeana* were widely cultivated in the commune, culms could be advantageously exploited in winter and spring. Such a strategy allocates labour throughout the year and distributes the economic and ecological risks among several NTFPs. However, availability of labour, material and credit is currently limited to few well-off households. With support programmes such as the Hunger Eradication and Poverty Reduction Programme established in 1998 poorer households should have received improved access to investment opportunities.

Both cases promoting an intensification and diversification likely offer similar cost-benefit schemes. With regard to resource conservation, a win-situation is achieved as soon as nobody has no longer an incentive to collect these products from the natural forests. Cultivation is one promising option. It requires, however, to address all interested households, and to ensure that they have access to credit and technical trainings. Planning of cultivation projects at provincial or national level should respond to the natural occurrence of NTFPs. For example, *Aerides odorata* should be kept in nurseries in the uplands of Hoa Binh province. Otherwise, unorganised or mass cultivations could

lead to supply surplus causing market over-saturations and rapid price declines ending up in a lose-win situation.

In terms of market understanding, a trade with several NTFPs supports the extension of trade networks and the information acquisition of new and promising NTFPs or processing methods. Concerning small-scale business activities, the focus on one NTFP and its promotion allows for a better understanding of entrepreneurial mechanisms, and likely leads to market specialization, which could open the access to national and international markets.

NTFP producers are demand driven or market drivers

As NTFP traders have easier access to credits and market information as well as a better knowledge of transportation, storage and locally added value, they often bring NTFP producers in a relationship of dependence likely in form of advances (BELCHER & KUSTERS 2004). In Ngo Luong commune, NTFP producers are demand driven as they were mostly unfamiliar with market demands, quality requirements and opportunities for storing or adding value locally. In addition, they face inconveniences to access local markets. The principal concern is how to transform the farmers in Ngo Luong commune to market drivers or at least to actors with more market power. The establishment of forest learning groups is a first step to train farmers on team activities and acquiring information on market, product, resource management, financial and legal issues. It requires collaboration among local authorities, extension offices and the target audience. These activities should be supported by national programmes, which aim to improve rural development through enhanced issues such as legal framework, infrastructure, access to market information, funding and training opportunities. However, the power of decision should be given to NTFP producers in order to enable efficient reactions on the local and often volatile NTFP markets.

Conclusion

This paper discussed options to improve rural development through promoting specific valuable NTFPs and conserving its natural resource basis in the two villages in Ngo Luong commune. Such win-win situations can be basically achieved through NTFPs which have ensured markets, provide high returns, are cultivable and follow clear and correctly implemented legal regulations on exploitation and trade. Promotions of NTFP cultivation only show advantages regarding conservation as long as all on the NTFP depending villagers have no need to collect it from the natural forests. This requires to have access to credit and funding, extension trainings on market mechanism, cultivations, sustainable resource management and small-scale businesses. In the case that NTFPs are considered an effective way to improve local livelihoods, communities and village organisations need to be supported by a well-informed extension service and international donors that draw on detailed market and environmental analyses of the promoted NTFPs.

Summary

Fairly all selected NTFPs of the upland commune Ngo Luong in northwest Vietnam reveal a high market potential including opportunities for sustainable resource management. In order to achieve win-win situations at the research site, management of specific NTFPs through intensification or diversification applied by single households or interest groups is discussed. Apart from better management practices the NTFP producers' position within the market chain should be strengthened by calling

for extension trainings on marketing relevant features. These findings base on investigations of household income, NTFP extraction and market chains of economically valuable NTFPs.

Résumé

Produits forestiers non ligneux sur les hautes terres du nord du Vietnam: potentiel commercial et aménagement des ressources

Le potentiel commercial de la plus grande partie des produits forestiers non ligneux étudiés dans la commune de montagne de Ngo Luong est élevé et les opportunités de gestion durable de la ressource sont réelles. Dans le but de dégager des situations profitables aux différents acteurs du site de recherche, des options d'intensification ou de diversification au niveau de simples ménages ou de groupes d'intérêt sont discutées dans le cas de quelques produits forestiers non ligneux. En outre, la position des producteurs dans la chaîne de commercialisation pourrait être renforcée en faisant appel à des actions de vulgarisation dans des domaines relevant du marché. Les résultats obtenus sont basés sur des recherches concernant le revenu des ménages, ainsi que la récolte et la filière de commercialisation de produits forestiers non ligneux présentant un intérêt économique.

Zusammenfassung

Nichtholzprodukte im nördlichen Berggebiet von Vietnam: Marktpotenzial und Ressourcenmanagement

Nahezu alle neun ausgewählten Nichtholzprodukte (NTFPs) der Berggemeinde Ngo Luong im Nordwesten Vietnams weisen ein hohes Marktpotenzial auf, welches überdies Möglichkeiten für ein nachhaltiges Ressourcenmanagement beinhaltet. Bezüglich gewinnbringender Lösungen sowohl für die Vermarktung von NTFPs als auch für deren nachhaltige Nutzung wird in diesem Aufsatz auf die Möglichkeit der Intensivierung und Diversifizierung der Nutzung von NTFPs durch einzelne Haushalte oder Interessengruppen hingewiesen. Nebst verbesserten Managementpraktiken sollte aber auch die Position der NTFP-Produzenten innerhalb der Marktkette gestärkt werden. Dies verlangt eine bessere Information sowie Trainingseinheiten zu marktrelevanten Merkmalen der NTFPs. Diese Ergebnisse stützen sich auf die Auswertung von Daten zum Haushaltseinkommen, zur NTFP-Entnahme aus dem Wald und zur Marktkette von ökonomisch wertvollen NTFPs.

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